REMARKS

Claims 1 to 10 are in the application and stand rejected over prior art in which claims 1 and 7 are rejected under 35 U.S.C. §103(a) as being unpatentable over the published article, "Transcritical CO_2 Cycle Technology", 2002 SAE Automotive Alternate Refrigerant Systems Symposium, July 2002, by J.S. Baek, et al. in view of Kasmer, and claims 2 to 6 and 8 to 10 are rejected under 35 U.S.C. §103(a) over the above published article by Baek taken in view of Kasmer and further in view of Hiwata. It is the Examiner's position that, as to claims 1 and 7, the basic inventive concept of these claims is disclosed by the Baek article except for the injection of high-pressure refrigerant at a halfway location inside the expander. The Examiner concludes, however, that the idea of adding an injection port to an expander is taught by Kasmer and is therefore not invention.

Regarding claims 2 to 6 and 8 to 10, the Examiner concludes that these claims add to the recitations contained in claims 1 and 7 only the presence of an adjustment valve inside the injection circuit, a sub-expander at the refrigerant inflow and outflow side, a four-way valve to control the discharge and suction sides of a compressor, a second compressor, and the use of an electric generator, all of which features are purported to be shown by Hiwata.

Pursuant to the position taken by the Examiner, Applicants hereby amend claim 1 to the extent of expressly reciting the refrigeration cycle apparatus of the claim as having a refrigerant circuit in which a compressor, an outdoor heat exchanger, an expander and an indoor heat exchanger are all connected to one another by pipes, and wherein an injection circuit is provided in the

refrigeration circuit, the injection circuit being operative to introduce high pressure refrigerant on the side of an outlet of the outdoor heat exchanger into a halfway location of the expansion process occuring in the expander. It is respectfully submitted that claim 1, as amended, and from which the other claims in the application depend, clearly distinguishes over the cited prior art because the Kasmer reference discloses no more than a principle refrigerant conducting circuit in which there is no separate circuit for introducing additional amounts of high pressure refrigerant to the principle circuit as required by the claims in the application.

Specifically, Kasmer merely relates to a system of a refrigerant-circulating pump, while the published article of Baek merely relates to a mechanism of an expander. These references do not disclose the structure of the present invention in which a separate injection circuit to control the flow rate into the expander is provided in a halfway location of the above expansion process. In the present invention, the injection circuit is provided in a halfway location of the above expansion process, thus to increase the flow rate of refrigerant per one expansion process and to allow all refrigerants to pass through the expander, so that expansion efficiency can be improved. Consequently, the structure and technical concept, as claimed, is not anticipated by the stated combination of the Baek et al. and Kasmer references.

Furthermore, there is nothing shown in the Hiwata reference that can be taken to cure the above defects in the combination of the article of Baek, et al. with Kasmer as an anticipation of claim 1, as now amended, from which the other claims in the application depend. On the contrary, Hiwata relates to an apparatus having a compressor and an auxiliary compressor driven by power recovered by an expander, wherein the expander is provided with a bypass circuit. The bypass circuit of Hiwata , however, is different from the counterpart of the present invention wherein the injection circuit is provided in a halfway location in the expansion process. Moreover the Hiwata apparatus does not contemplate increasing the flow rate of refrigerant per one expansion process and allowing all refrigerants to pass through the expander so that expansion efficiency can be improved. Consequently, the present invention is clearly an improvement over the apparatus of Hiwata.

In view of the aforementioned amendments and accompanying remarks, claims 1-10, as amended, are believed to be in condition for allowance, which action at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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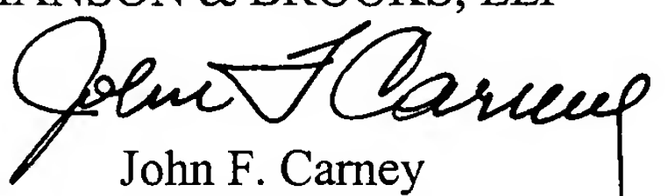

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